Structure and Composition of Polymer/Surfactan Mixtures at the Air-Liquid Interface (Invited)

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The use of the specular reflection of neutrons to study the structure and composition of polymer / surfactant mixtures at the air-water interface will be described. Results from a number of different systems will be presented, and contrasted with the information available from surface tension.

Particular emphasis will be placed on recent data for the mixture of dodecyl trimethyl ammonium bromide and sodium polystyrene sulphonate in aqueous solution. Using H / D isotopic substitution on the polymer, surfactant and water, details of both the composition and structure of the surface region is obtained. It is shown for this and other systems that the complex surface behaviour observed is not consistent with the measured surface tension behaviour. For the dodecyl trimethyl ammonium bromide / sodium polystyrene sulphonate mixture complex surface ordering is observed with increasing surfactant concentration.